

Soil Testing for Better Lawns and Gardens

Fall is when some people are hoping to get their lawns renovated or to sow some grass seed on a few bare spots in the yard. Maybe you want to show up the neighbors and have the greenest lawn on the block. What kind of fertilizer do you need, if any? Well, a good place to start would be MU's Soil and Plant Testing Lab.

The University of Missouri Soil & Plant Testing Lab, sponsored by University Extension, provides soil, plant, water, greenhouse media, and compost analyses services for farmers, homeowners, vegetable and fruit growers, golf course managers, greenhouse managers, lawn and landscape specialists, government and state agencies, and agri-industries. The lab ensures reliable results, and unbiased nutrient recommendations are given to farmers and homeowners to help them grow a good crop or healthy lawn without polluting the environment.

Soil testing is a gardener's best guide to the wise and efficient use of fertilizer and soil amendments. A soil test is like taking an inventory of the nutrients available to plants and determining which are too high, too low or just right. While plant growth may offer clues to nutrient availability, gardeners won't precisely know until they test their soil. Although soil-testing kits are available in garden centers, laboratory testing is more reliable, and the results from laboratories are accompanied with interpretations and recommendations.

Why Do a Soil Test? Soil fertility fluctuates throughout the growing season each year. The quantity and availability of mineral nutrients are altered by the addition of fertilizers, manure, compost, mulch, and lime or sulfur. Leaching is also a factor. Furthermore, a large quantity of mineral nutrients is removed from soils as a result of plant growth and development and the harvesting of crops. A soil test will determine the current fertility status. It also provides the necessary information needed to maintain the optimum fertility year after year.

Some plants grow well over a wide range of soil pH, while others grow best within a narrow range of pH. Most turfgrasses, flowers, ornamental shrubs, vegetables and fruits grow best in slightly acidic soils which represent a pH of 6.0 to 7.0. Plants such as rhododendron, azalea, pieris, mountain laurel and blueberries require a more acidic soil to grow well. A soil test is the only precise way to determine whether the soil is acidic, neutral or alkaline.

A soil test takes the guesswork out of fertilization and is extremely cost effective. It not only eliminates the waste of money spent on unnecessary fertilizers, but also eliminates over-usage of fertilizers, hence helping to protect the environment.

When Do I Soil Test? Soil samples can be taken in the spring or fall for established sites. Although fall and early spring are typical times to test soil, one can really do it any time the soil is not frozen, but don't sample after recent fertilizer or lime applications. For new sites, soil samples can be taken any time the soil is workable. Most people conduct their soil tests in the spring. However, fall is a preferred time to take soil tests if one wants to avoid the spring rush and

suspects a pH problem. Fall soil testing will allow you ample time to apply lime to raise the soil pH. Sulfur should be applied in the spring if the soil pH needs to be lowered. Garden soils should be tested every two to three years.

Soil testing is strongly recommended when establishing a new lawn, renovating an existing lawn or landscaping. The cost of soil testing is minor in comparison to the cost of seed, plants and labor. Correcting a problem before planting is much simpler and cheaper than doing it afterwards. Once your yard is established, continue to take periodic soil samples. Routine fertilizer or lime applications can result in excessive soil nutrient levels or a deleterious soil pH. For example, many fertilizers tend to lower soil pH, and, after several years of fertilization, the pH may drop below the desirable level.

Customers can have their soil tested to determine what is needed to grow a specific plant or crop. A plant analysis can be used to diagnose a nutrient deficiency or toxicity problem or to monitor the nutritional status of a plant. The latter is important for perennial plants, especially fruit crops and landscaping trees.

The test results are only as good as the sample taken. It is extremely important to provide a representative sample to the testing lab so that a reliable test can be completed and recommendations made for the entire area. This can be accomplished by submitting a composite sample. A good representative composite sample from a garden or lawn should contain 8 to 10 cores or slices. Each core or slice should be taken at the same depth (0 to 6") and volume at each site. Sample at random in a zigzag pattern over the area and mix the sample together in a clean plastic bucket. More samples need to be taken if the area was recently limed or fertilized. Separate samples need to be taken from lawns, gardens, flowerbeds or shrub borders. Separate samples should be taken from areas with a distinctive soil types or plant performances.

Testing your soil for nutrients and pH is important to provide balanced application of nutrients, while avoiding overapplication. At the University of Missouri Soil Testing Laboratory, we offer a regular fertility test that includes measurements of pH, lime requirement, organic matter, available phosphorus, potassium, calcium, magnesium and cation exchange capacity. Soil pH greatly influences plant nutrient availability. Adjusting pH often corrects the nutrient problem for most plants. The optimum pH for most plants is between 6.0 and 7.0. The lime requirement measurement indicates the amount of amendment (usually lime) necessary to correct a pH problem. Organic matter has several roles in the soil; generally, the more organic matter the better. Nitrogen recommendations are based on the organic matter level. Phosphorus, potassium, calcium and magnesium are all essential plant nutrients. For the layman, a cation exchange capacity (CEC) value has no meaning, but it is a measure of the soil's ability to hold nutrients.

Test costs vary according to the number of nutrients tested. The University of Missouri Soil Testing Laboratory charges \$9.00 (when submitting direct to the lab) for a regular fertility test. Several other specific analyses are available.

These include, but are not limited to, soil analysis for sulfur, micro-nutrients (Zinc, Iron, Copper, Manganese, Boron), salt content (electrical conductivity), and soil texture. Test reports provide interpretation and nutrient recommendations. The turnaround time for a soil test is 24 hours. Customers have to add mailing time to get the reports by regular mail services. For plant, water, greenhouse media and compost tests, the turnaround time is within 5 working days. You can contact your Regional Agronomy/Horticulture/Natural Resources Specialist or local Extension Office to obtain sample information forms and sample boxes. You can also submit samples through their offices. These Regional Specialists at your local Extension Offices can be a source of information for interpreting and personalizing your soil test reports and recommendations. Samples can also be submitted directly to the University of Missouri Soil Testing labs at 23 Mumford Hall, Columbia, MO 65211 (573-882-0623)

The lab maintains a comprehensive Web site at <http://www.soiltest.psu.missouri.edu>. The site includes information on how to collect soil and plant samples and how and where to submit samples. The Web site provides a list of services provided by the lab, costs of tests, sample information forms, location of the lab and other relevant information. The lab now also provides web access to soil test results with a specifically assigned password to clients upon request. We also have the option for electronic mailing of data if required.

Taking a soil sample

- **Your local University Outreach and Extension center has soil sample boxes available for use at no charge. One box (1.5 to 2 cups) is all the University lab needs for analyses.**
- **Using a small shovel or soil probe, sample to a 3-inch depth on established lawns or, before seeding, to a 4-6 inch depth.**
- **Take 12 or more random cores from each area of the lawn to be tested and remove the thatch and live plant material before breaking up the cores and mixing thoroughly in a dry plastic bucket. (Metal buckets contaminate the sample with micro-nutrients.) Take random samples from the lawn as a whole unless there is a need to sample problem areas separately (see Figure 1).**
- **Air dry the sample overnight before sending.**